

WHAT IS CLAIMED IS:

1. An image processing apparatus for processing image information obtained by exposing radiation on an object, comprising:

5 generation means for generating observation area information indicating an observation area of the object; input means for inputting a size of an output medium; and

determination means for determining an output method  
10 of the observation area on the basis of the size of the output medium.

2. The apparatus according to claim 1, wherein said radiation is X-ray.

15 3. The apparatus according to claim 1, wherein said observation area is an area where said radiation is exposed.

4. The apparatus according to claim 1, further  
20 comprising output mode input means for inputting an output mode representing an output format of the observation area.

5. The apparatus according to claim 4, wherein said output mode includes a mode in which the observation area  
25 is divided into a plurality of areas and the plurality of areas are formed on a plurality of output media.

6. The apparatus according to claim 4, wherein said

output mode includes a mode in which the observation area is reduced and the reduced area is formed on a single output medium.

- 5 7. An image processing method for processing image information obtained by exposing radiation on an object, comprising:

the generation step of generating observation area information indicating an observation area of the object;

- 10 the input step of inputting a size of an output medium; and

the determination step of determining an output method of the observation area on the basis of the size of the output medium.

- 15 8. A storage medium storing a control program for causing a computer to process image information obtained by exposing radiation on an object, said control program comprising:

- 20 a code of the generation step of generating observation area information indicating an observation area of the object;

a code of the input step of inputting a size of an output medium; and

- 25 a code of the determination step of determining an output method of the observation area on the basis of the size of the output medium.

9. An image processing system for processing an image signal obtained by electronically converting an input image and outputting the image signal, characterized by comprising:

5        output mode input means for inputting an output mode representing an output format of an observation area on an output medium;

         input means for inputting a size of an effective image area of the output medium; and

10       determination means for determining an output method of the observation area on the basis of the observation area and contents input by said output mode input means and said input means.

10. The system according to claim 9, characterized in  
15       that the image is obtained by irradiating an object with an X-ray generated by an X-ray generation apparatus, and

         the observation area is set on the basis of an X-ray irradiation stop of said X-ray generation apparatus.

11. The system according to claim 10, characterized in  
20       that the observation area is set on the basis of an irradiation area of the X-ray generated by said X-ray generation apparatus, which is extracted from the image.

12. The system according to claim 9, characterized in  
         that the observation area is set on the basis of a  
25       to-be-photographed portion in the image.

13. The system according to claim 9, characterized in

that said determination means determines, on the basis of an aspect ratio of the observation area, a type of output medium to be used to output the observation area.

14. The system according to claim 9, characterized in  
5 that said output mode input means has at least a life-size output mode in which the observation area is output in an actual size, a reduction output mode in which the observation area is reduced and output, an image extraction  
10 output mode in which a predetermined area is extracted from the observation area and output, and a multiple output mode in which the observation area is divided into a plurality of division areas and output to a plurality of output media.

15. The system according to claim 9, characterized in  
that when a multiple output mode is input by said output  
15 mode input means, and the observation area does not fall within the effective image area of the output medium, said determination means determines to divide each image corresponding to a size of the effective image area including boundaries of the observation area and output the  
20 divided images to a plurality of output media.

16. An image processing method of processing an image signal obtained by electronically converting a photographed image and outputting the image signal, characterized by comprising:

25 the output mode input step of inputting an output mode representing an output format of an observation area on an

output medium;

the input step of inputting a size of an effective image area of the output medium; and

the determination step of determining an output  
5 method of the observation area on the basis of the observation area and contents input in the output mode input step and the input step.

17. The method according to claim 16, characterized in that the image is obtained by irradiating an object with  
10 an X-ray generated by an X-ray generation apparatus, and

the observation area is set on the basis of an X-ray irradiation stop of said X-ray generation apparatus.

18. The method according to claim 17, characterized in that the observation area is set on the basis of an  
15 irradiation area of the X-ray generated by said X-ray generation apparatus, which is extracted from the image.

19. The method according to claim 16, characterized in that the observation area is set on the basis of a to-be-photographed portion in the image.

20. The method according to claim 16, characterized in that the determination step comprises determining, on the basis of an aspect ratio of the observation area, a type of output medium to be used to output the observation area.

21. The method according to claim 16, characterized in  
25 that the output mode input step allows to input at least one of a life-size output mode in which the observation area

is output in an actual size, a reduction output mode in which the observation area is reduced and output, an image extraction output mode in which a predetermined area is extracted from the observation area and output, and a  
5 multiple output mode in which the observation area is divided into a plurality of division areas and output to a plurality of output media.

22. The method according to claim 16, characterized in that when a multiple output mode is input in the output mode  
10 input step, and the observation area does not fall within the effective image area of the output medium, the determination step comprises determining to divide each image corresponding to a size of the effective image area including boundaries of the observation area and output the  
15 divided images to a plurality of output media.

23. A computer-readable memory which stores program codes for controlling an image processing system for processing an image signal obtained by electronically converting a photographed image and outputting the image  
20 signal, characterized by comprising:

a program code of the output mode input step of inputting an output mode representing an output format of an observation area on an output medium;

a program code of the input step of inputting a size  
25 of an effective image area of the output medium; and

a program code of the determination step of

determining an output method of the observation area on the basis of the observation area and contents input in the output mode input step and the input step.

24. A photographing system for processing an image  
5 obtained by photographing and outputting the image,  
characterized by comprising:

photographing means for photographing an image;

10 output mode input means for inputting an output mode  
representing an output format of an observation area on an  
output medium;

input means for inputting a size of an effective image  
area of the output medium; and

15 determination means for determining an output method  
of the observation area on the basis of the observation area  
and contents input by said output mode input means and said  
input means.

25. The system according to claim 24, characterized in  
that said photographing means comprises an X-ray  
photographing apparatus having an X-ray generation  
20 apparatus and an X-ray detection apparatus, and

the observation area is set on the basis of an X-ray  
irradiation stop of said X-ray generation apparatus.

26. The system according to claim 25, characterized in  
that the observation area is set on the basis of an  
25 irradiation area of the X-ray generated by said X-ray  
generation apparatus, which is extracted from the image.

27. The system according to claim 24, characterized in that the observation area is set on the basis of a to-be-photographed portion in the image.

28. The system according to claim 24, characterized in  
5 that said determination means determines, on the basis of an aspect ratio of the observation area, a type of output medium to be used to output the observation area.

29. The system according to claim 24, characterized in  
10 that said output mode input means has at least a life-size output mode in which the observation area is output in an actual size, a reduction output mode in which the observation area is reduced and output, an image extraction output mode in which a predetermined area is extracted from the observation area and output, and a multiple output mode  
15 in which the observation area is divided into a plurality of division areas and output to a plurality of output media.

30. The system according to claim 24, characterized in that when a multiple output mode is input by said output mode input means, and the observation area does not fall  
20 within the effective image area of the output medium, said determination means determines to divide each image corresponding to a size of the effective image area including boundaries of the observation area and output the divided images to a plurality of output media.

25 31. A control method for a photographing system for processing an image obtained by photographing and



outputting the image, characterized by comprising:

the photographing step of photographing an image;

the output mode input step of inputting an output mode  
representing an output format of an observation area on an

5 output medium;

the input step of inputting a size of an effective  
image area of the output medium; and

the determination step of determining an output  
method of the observation area on the basis of the  
10 observation area and contents input in the output mode input  
step and the input step.

32. The method according to claim 31, characterized in  
that the photographing step comprises photographing the  
image using an X-ray photographing apparatus having an  
15 X-ray generation apparatus and an X-ray detection apparatus,  
and

the observation area is set on the basis of an X-ray  
irradiation stop of said X-ray generation apparatus.

33. The method according to claim 32, characterized in  
20 that the observation area is set on the basis of an  
irradiation area of the X-ray generated by said X-ray  
generation apparatus, which is extracted from the image.

34. The method according to claim 31, characterized in  
that the observation area is set on the basis of a  
25 to-be-photographed portion in the image.

35. The method according to claim 31, characterized in

that the determination step comprises determining, on the basis of an aspect ratio of the observation area, a type of output medium to be used to output the observation area.

36. The method according to claim 31, characterized in  
5 that the output mode input step allows to input at least one of a life-size output mode in which the observation area is output in an actual size, a reduction output mode in which the observation area is reduced and output, an image extraction output mode in which a predetermined area is  
10 extracted from the observation area and output, and a multiple output mode in which the observation area is divided into a plurality of division areas and output to a plurality of output media.

37. The method according to claim 31, characterized in  
15 that when a multiple output mode is input in the output mode input step, and the observation area does not fall within the effective image area of the output medium, the determination step comprises determining to divide each image corresponding to a size of the effective image area  
20 including boundaries of the observation area and output the divided images to a plurality of output media.

38. A computer-readable memory which stores program codes for controlling a photographing system for processing an image obtained by photographing and outputting the image,  
25 characterized by comprising:

a program code of the photographing step of

photographing an image;

a program code of the output mode input step of inputting an output mode representing an output format of an observation area on an output medium;

5 a program code of the input step of inputting a size of an effective image area of the output medium; and

a program code of the determination step of determining an output method of the observation area on the basis of the observation area and contents input in the  
10 output mode input step and the input step.

39. An image processing apparatus characterized by comprising:

acquisition means for specifying a to-be-output area of an image represented by image data as an output image  
15 and acquiring a size of the output image;

selection means for selecting, on the basis of the size of the output image acquired by said acquisition means, one image output size from a plurality of types of image output sizes set in advance;

20 layout determination means for determining a layout of the output image in an output area having the image output size selected by said selection means;

display means for displaying on the basis of a layout state determined by said layout determination means; and

25 change means for changing the layout state of the output image in the output area in accordance with an

instruction for changing the layout state displayed by said display means.

40. The apparatus according to claim 39, characterized in that said display means reduces the output area and the  
5 output image and displays the output image in the layout state determined by said layout determination means.

41. The apparatus according to claim 39, characterized in that said display means overlays, in accordance with the layout state, an image obtained by reducing an image  
10 representing the output area on an image obtained by reducing the image represented by the image data and displays the layout state.

42. The apparatus according to claim 39, characterized by further comprising output means for outputting the  
15 output image to an output medium having the output area on the basis of a final layout state determined by said layout determination means and said change means.

43. The apparatus according to claim 39, characterized in that said selection means selects an output area with  
20 an image output size having a minimum residual area, within which the entire output image falls.

44. The apparatus according to claim 43, characterized in that said selection means selects an output area having an output size assuming that the entire output image falls  
25 within the output size as long as a outstretch amount of the output image from the output\_size falls within a

predetermined range, and removes the outstretch portion from the output image.

45. The apparatus according to claim 39, characterized by further comprising reduction means for, when no  
5 appropriate output area is obtained by said selection means, reducing the output image such that the output image falls within a predetermined output area.

46. The apparatus according to claim 39, characterized by further comprising deletion means for, when no  
10 appropriate output area is obtained by said selection means, deleting a outstretch portion of the output image from a predetermined output area.

47. The apparatus according to claim 39, characterized by further comprising extraction means for, when no  
15 appropriate output area is obtained by said selection means, displaying the output image overlaid on a predetermined output area and extracting a desired area from the output image by user's operation.

48. The apparatus according to claim 39, characterized  
20 in that said display means displays the entire image represented by the image data, a range of the output image, and the output area in an identifiable state.

49. The apparatus according to claim 39, characterized in that said display means displays the entire image  
25 represented by the image data, the output area specified by said acquisition means, and an output area to be actually

output in an identifiable state.

50. The apparatus according to claim 39, characterized in that the image data represents an X-ray digital image obtained by X-ray irradiation, and

5 the output image specified by said acquisition means is an image of an area specified by recognizing an irradiation field in the X-ray digital image.

51. The apparatus according to claim 50, characterized in that the plurality of types of output sizes correspond  
10 to a plurality of film sizes, respectively, and

said apparatus further comprises output means for extracting the output image and outputting the output image to a film having the output area on the basis of a final layout state determined by said layout determination means  
15 and said change means.

52. The apparatus according to claim 45, characterized by further comprising

output means for outputting the output image to an output medium having the output area on the basis of a final  
20 layout state determined by said layout determination means and said change means, and

addition means for, when the output image is reduced by said reduction means, adding one of a symbol and a character representing reduction.

25 53. An image processing method characterized by comprising:

the acquisition step of specifying a to-be-output area of an image represented in image data as an output image and acquiring a size of the output image;

the selection step of selecting, on the basis of the  
5 size of the output image acquired in the acquisition step, one image output size from a plurality of types of image output sizes set in advance;

the layout determination step of determining a layout of the output image in an output area having the image output  
10 size selected in the selection step;

the display step of displaying on the basis of a layout state determined in the layout determination step; and

the change step of changing the layout state of the  
output image in the output area in accordance with an  
15 instruction for changing the layout state displayed in the display step.

54. The method according to claim 53, characterized in that the display step comprises reducing the output area and the output image and displaying the output image in the  
20 layout state determined in the layout determination step.

55. The method according to claim 53, characterized in that the display step comprises overlaying, in accordance with the layout state, an image obtained by reducing an image representing the output area on an image obtained by  
25 reducing the image represented by the image data and displaying the layout state.

56. The method according to claim 53, characterized by further comprising the output step of outputting the output image to an output medium having the output area on the basis of a final layout state determined in the layout  
5 determination step and the change step.

57. The method according to claim 53, characterized in that the selection step comprises selecting an output area with an image output size having a minimum residual area, within which the entire output image falls.

10 58. The method according to claim 57, characterized in that the selection step comprises selecting an output area having an output size assuming that the entire output image falls within the output size as long as a outstretch amount of the output image from the output size falls within a  
15 predetermined range, and removing the outstretch portion from the output image.

59. The method according to claim 53, characterized by further comprising the reduction step of, when no appropriate output area is obtained in the selection step,  
20 reducing the output image such that the output image falls within a predetermined output area.

60. The method according to claim 53, characterized by further comprising the deletion step of, when no appropriate output area is obtained in the selection step,  
25 deleting a outstretch portion of the output image from a predetermined output area.



61. The method according to claim 53, characterized by further comprising the extraction step of, when no appropriate output area is obtained in the selection step, displaying the output image overlaid on a predetermined  
5 output area and extracting a desired area from the output image by user's operation.

62. The method according to claim 53, characterized in that the display step comprises displaying the entire image represented by the image data, a range of the output image,  
10 and the output area in an identifiable state.

63. The method according to claim 53, characterized in that the display step comprises displaying the entire image represented by the image data, the output area specified in the acquisition step, and an output area to be actually  
15 output in an identifiable state.

64. The method according to claim 53, characterized in that the image data represents an X-ray digital image obtained by X-ray irradiation, and

the output image specified in the acquisition step  
20 is an image of an area specified by recognizing an irradiation field in the X-ray digital image.

65. The method according to claim 64, characterized in that the plurality of types of output sizes correspond to a plurality of film sizes, respectively, and

25 the method further comprises the output step of extracting the output image and outputting the output image

to a film having the output area on the basis of a final layout state determined in the layout determination step and the change step.

66. The method according to claim 59, characterized by  
5 further comprising

the output step of outputting the output image to an output medium having the output area on the basis of a final layout state determined in the layout determination step and the change step, and

10 the addition step of, when the output image is reduced in the reduction step, adding one of a symbol and a character representing reduction.

67. A storage medium which storing a control program for causing a computer to control an output image size,  
15 characterized in that the control program comprises:

a code of the acquisition step of specifying a to-be-output area of an image represented in image data as an output image and acquiring a size of the output image;

20 a code of the selection step of selecting, on the basis of the size of the output image acquired in the acquisition step, one image output size from a plurality of types of image output sizes set in advance;

a code of the layout determination step of determining a layout of the output image in an output area  
25 having the image output size selected in the selection step;

a code of the display step of displaying on the basis

of a layout state determined in the layout determination step; and

5 a code of the change step of changing the layout state of the output image in the output area in accordance with an instruction for changing the layout state displayed in the display step.